

**STAT 750 HW#1**  
**Due Date: Thursday, 1/31/08**

**Note:** The numbered problems (e.g. 1.4, 1.18, etc.) refer to the problems in the textbook on pages 40-44.

1. 1.4 (only a, b, and c)
2. 1.6
3. 1.7
4. 1.8
5. 1.15
6. 1.18 (see directions below)
7. 1.19

**Note:** For problem 6 (i.e. 1.18) you are to ignore the directions given in the problem and do the following. The answers to these questions should be obtained using ITSM. If a problem specifically asks for a plot you need to include it in your report. You also need to include any computer output that justifies your answers.

- a) Obtain a time series plot of the data and comment on the characteristics (e.g. trend, seasonality, etc.).
- b) Perform a classical decomposition with a quadratic trend and a seasonality of 12. What are the estimates of the trend and seasonal parameters?
- c) Obtain a time series plot of the residuals (i.e. the series left over after the trend and seasonality from part b has been removed). Comment on any characteristics.
- d) Obtain the SACF for the residual series in part c. Based on the plot do the residuals appear to be white noise? Justify your answer. Furthermore, carry out the Ljung Box version of the Portman Tau test. Be sure to state the test statistic value and corresponding p-value. How does this compare to the SACF?
- e) Forecast the next five values of the original time series assuming the residuals are white noise. What are the actual forecast values?